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ABSTRACT

A review of followup study research is reported which focused on issues and trends in the evaluation of vocational education programs and their implications for human resource development. The analysis of representative studies selected from a survey of the literature is divided into four sections, one for each of four types of studies: (1) Administrative reports, (2) comparative studies, (3) cost-benefit analysis studies, and (4) studies relating to the development of technology, instrumentation, data systems, methodology, and guides and manuals. A brief summary is presented on the usefulness of each type of study, and general comments are added regarding future trends for followup research and criteria used to evaluate vocational programs. The overall conclusion stated is that followup studies continue to suffer from some severe problems, some of which are procedural and others conceptual. These problems are listed, and recommendations are made regarding (1) the need for increased research activities on relationships between vocational education and economic cycles and (2) the need to encourage and sponsor research efforts on a higher scale at the State, regional, and national levels. A bibliography lists 37 studies. (JT)

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WHAT HAPPENS AFTER TRAINING:
A REVIEW OF FOLLOW-UP OF
VOCATIONAL GRADUATES

By

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PREFACE

There may not be an obvious or direct relationship between economic development and follow-up of vocational graduates; but to the extent that vocational training produces skilled manpower, follow-up data will measure the success or failure of such an endeavor. Follow-up data, therefore, are essential to plan and evaluate the development of human resources which are essential for industrial and economic development.

In addition to their usage as an evaluative measure of vocational trainings' success, follow-up data provide an essential dimension to the information systems for human resources planning. The concepts of manpower supply and demand are highly related to placement on jobs. Success or failure of program participants can best be verified by the kind of jobs on which they are placed. Verifying the placement is an important function of follow-up. Planning and implementation of vocational education, and for that matter any manpower development program, will be incomplete without appropriate follow-up data.

In spite of the research efforts of over a decade and hundreds of studies, we still have not developed adequate measures which would be acceptable to most administrators of vocational education or manpower programs. On the following pages an effort has been made to recap these research efforts with the hope that it will show the need for development in critical areas of follow-up and evaluation.

Krishan K. Paul

INTRODUCTION

Billions of dollars are spent every year in the United States to bridge the gap between jobs and people by training the youths and adults in occupations needed by an expanding economy and increasingly complex technology. A number of federal, state, and local government agencies from the public sector, labor unions, private schools, and individual employers from the private sector are all involved in this monumental task of human resource development which is crucial to economic growth and technological progress.

Although most of the formal training is provided through a large number of vocational education programs administered by public and private schools and a host of federal agencies including military and the manpower programs, individual employers and labor unions contribute significantly to the training effort. As a total national effort the formal training programs represent a staggering investment in human capital, although it may still be far short of actual needs. The dollar amount spent on training surpasses the annual defense budget, and it is perhaps the largest undertaking in the country in terms of employment and jobs. And yet, the success (or failure) of vocational education programs is measured only partially and often intuitively rather than analytically using economic and statistical analysis techniques.

To complicate an already complex situation the U. S. has not yet adopted a well enuciated manpower policy or a coherent human resource development plan which would set up goals and objectives for the nation to achieve in the near as well as the distant future. Human resources development efforts of the United States are like a modern ship which is fitted with the very latest technically sophisticated devices, but which has not been provided with either destination or navigational charts.

Let us consider vocational education, for example, which offers thousands of training courses with student enrollment in the millions. The passage of the Vocational Education Act of 1963 mandated the states to submit annual and long-range plans to the federal government. However, no direction or target was given to the states as a framework in which to fit their individual local plans. There was no provision for the federal government to formulate a national policy or a plan. In the absence of any overall direction, state plans are heterogenous in objective, though fairly uniform in technical format. The consolidation of such state plans does not suffice as a substitute for a national plan for vocational education.

A similar situation also exists for other human resource development programs supported and sponsored by the federal government. In the absence of a well articulated and cohesive manpower policy, state and local plans for manpower development are reduced to a patchwork effort rather than a well-jointed and well coordinated endeavor aimed at meeting national manpower needs including those of industry and business.

Absence of national manpower policy also results in duplication of efforts by different federal and state agencies. Many a time, training programs initiated, sponsored, and supported by the U. S. Department of Labor are not coordinated with those sponsored and supported by the U. S. Department of Health, Education, and Welfare. Absence of clear guidelines encourages fragmentation of efforts at the local level also.

This paper focuses on the issues and trends in evaluation of vocational education programs and their implications for human resource development. Some of the trends, and most of the research effort, is, however, as appropriate to manpower programs as vocational education because the overall purpose of both is development of human resources. Purpose of Vocational Education Act of 1963 is

stated as the education "...which is realistic in the light of actual and anticipated opportunities for gainful employment." This statement of purpose is general enough to fit any manpower development program whether it be provided through a vocational school or an employer providing on-the-job training to youths and adults.

REVIEW OF CURRENT TRENDS

The passage of the Vocational Education Act of 1963 which mandated the states to prepare statewide vocational education plans started a flurry of activity related to the planning process. Under the impetus of federal funding old processes were modified and new planning processes were developed to help local and state administrators of vocational education. However, there has been no coordination among the states to seek a unity of purpose or approach. Consequently, there is no uniformity or standardization in the planning process and, therefore, state plans. There are dozens of studies on the development of planning systems, pilot testing of planning systems, and installation of planning systems. But, studies on the workings of planning systems are conspicuous by their absence. There is a serious shortage of information on how planning is actually working. Lawrence and Dane (1974), while commenting on the Program Planning and Budgeting System (PPBS), deplore the scarcity of evaluative data as the following:

> There is also a shortage of information on the success or failure of planning, though there is now sufficient information available to indicate that PPBS may not be fulfilling its early promise and that other planning systems are surviving aground on a rock called "lack of data."

There is an urgent need to evaluate existing vocational educational plans and their outcomes before embarking on additional planning systems or efforts. A set of well tested and valid measures also need to be developed in order to evaluate vocational education plans and their outcomes.

Literature is replete with studies which tend to evaluate vocational education programs. Most of these studies are descriptive though some have used experimental design quite effectively. All evaluative studies, however, are conducted to

answer the following questions which are of considerable interest to planners and program administrators.

1. What happens to the youths and adults who after completion of their training try to find work rather than continue schooling?
2. Are there significant differences between the job-related experiences of persons who complete vocational education programs and those who do not?
3. Do the vocational education programs justify their cost?

Studies varying in design and scope have tried to find answers to one or more of the above questions. Many of these studies have also tried to develop and pilot-test methodologies to compile a data base by surveying former students of vocational education programs. These evaluative efforts are generally termed as follow-up studies.

It is hard to classify evaluative and follow-up studies on the basis of either design or scope. The following classification is for convenience only and does not reflect any distinct design or scope features. Many of the studies could very well be classified under more than one heading. There is, therefore, no rigidity to this system and it should be considered flexible as far as the scope and design of studies are concerned.

Following are the four groups in which follow-up studies have been divided for review in this paper.

1. Administrative reports
2. Comparative studies
3. Cost-benefit analysis studies
4. A fourth group of studies relates to the development of technology, instrumentation, data systems, methodology, and guides and manuals.

It is neither the intent nor the scope of this paper to review all follow-up studies conducted in the United States to evaluate vocational education programs. Only a few of the representative studies and their results are discussed on the following pages to illustrate the emerging trends in vocational education program evaluation.

Administrative Reports

A survey of literature reveals a large number of studies which though different in scope, approach, and methodology, can best be described as administrative reports. The result or outcome of these studies is required for administrative reports from local to state and federal administrators. These reports may be based on nationwide or statewide surveys of former vocational education students or they may be based on a verbal inquiry by an instructor of a vocational program. The information compiled and transmitted in these reports generally is of the following pattern:

1. Job placement: whether (the former vocational trainee was) placed on a training related, unrelated (to training) job, or if (he was) still unemployed.
2. Wages: monthly, weekly, or hourly wages earned by those (who were) employed.
3. Continuing Education: whether continuing to attend school for more education or training.
4. Evaluation: how the program and educational services provided were rated (by the former trainee).
5. Counseling Services: whether counseling and job placement services were provided while in school.
6. Demographics: age, sex, location, etc.

It should be pointed out here that these points are illustrative only and do not represent the full spectrum of data classification used in these studies. However, all studies in this grouping play a very useful role in vocational education program evaluation and planning by providing a data base for decision making at various levels of program administration. They are also important as a communication link between the local, state, and federal administrations also.

Eninger (1968) conducted one of the most comprehensive follow-up studies with a sample of 5,327 former students of vocational programs drawn from one hundred randomly selected schools. The study was designed to evaluate vocational programs by providing the information on 1) time required to get a full-time job, 2)relatedness of job to training, 3)earnings, 4) job satisfaction, and 5) mobility. Data on job stability and employer satisfaction were also compiled. To provide a longitudinal dimension to the study, Eninger surveyed the classes of 1943, 1958, and 1962. Some of the other variables used in this study to compare graduates' post-school performance were the amount of schooling after termination of vocational training, types of leisure activities, organizational affiliations, and attitude towards former schools and vocational programs.

Some of the significant findings of this study were the following:

1. A majority of the trade and industry (T&I) program graduates went directly to work after completion, though the jobs found by more than a third were not related to their training.
2. Starting wages depended on local labor markets, but the graduates with vocational training gained faster raises in wages than graduates from academic programs.

3. Graduates placed on training related jobs reported higher job satisfaction and job security than those placed on jobs unrelated to their training.
4. About 87 percent of the graduates had not moved out of the community in which they went to school.

Another comprehensive survey of vocational education graduates was conducted by the U. S. Office of Education in 1966 with 606,872 vocational graduates as subjects. It was reported that 80 percent of all graduates available for placement found jobs for which they were trained, or jobs highly related to their training. Only four percent of the graduates were unemployed. The report also listed the occupations entered most frequently by the graduates.

Paul and others (1972) in a statewide follow-up survey in Kentucky studied ten thousand former students of vocational education, the class of 1971. A mail questionnaire was used for this survey with telephone and personal interviews to verify the responses and to offset or eliminate a possible bias due to non-response. Some of the important findings from this statewide survey were as follows:

1. Of the 68 percent of former students available for placement, only 41 percent found jobs related to their training, and as many as fifteen percent were still unemployed at the time of the survey.
2. Of the 32 percent not available for employment, 65 percent continued their schooling after the completion of their vocational training.
3. A list of jobs on which the former students were frequently placed

was compiled. Two most frequently reported jobs were "secretary" and "nurse aide."

4. A great majority of those working on training-related jobs reported a higher degree of job satisfaction than those placed on unrelated jobs.

The New Mexico State Department of Education (1968) studied the experiences of graduates from four area vocational schools. Among the findings, significant ones are the following:

1. Of the 31 percent of graduates who were gainfully employed, 82 percent were working on training-related jobs.
2. The average graduate had been working on the job only a year or less; hence no readings were available on advancements in salary levels.
3. Over 72 percent of those employed found jobs within or near their home communities.

Another statewide study conducted by Green (1971) surveyed the parents of vocational students to determine their attitudes toward the vocational and technical programs in Nebraska. The parents indicated that public schools should place greater emphasis on meeting student needs whether they be preparing for college or going to work. A majority of the parents felt that their children were capable of making occupational plans and had the ability to succeed in their chosen fields.

Bates (1968) studied migration patterns of associate degree graduates from institutions in Oklahoma. He found significant differences among those who migrated out of Oklahoma versus those who found jobs within the state.

Those graduates who moved out of Oklahoma earned better salaries and wages than those who found jobs within the state. He also found that reasons to move out of the state were more economic than social. As a footnote to his study, Bates found that out-of-state recruiters spent more effort and offered an average of 13 percent better salaries to associate-degree graduates in Oklahoma than the local employers.

Taves and Coller (1964) studies reasons for out-migration of high school graduates in Minnesota rural communities. They surveyed a total of 739 graduates from rural schools. Some of their findings are the following:

1. Higher the career aspirations of the graduate, stronger was the will to move.
2. There was also a positive corelation between the will to move and father's occupation.
3. Generally, older graduates tended to move more often than the younger ones.
4. Graduates from areas with higher agricultural income moved more often than those from lower agricultural income.

Kaufman and Lewis (1968) evaluated vocational education programs and curricula in three cities in Pennsylvania in order to recommend improvements. They found that most students entered the world of work without specialized job-related training; an imbalance existed between the vocational program enrollments and the labor market composition; less than half of the male graduates obtained jobs that were directly related to their training; and most of the graduates did not receive any assistance from the school counselors.

Seamans and others (1972) evaluated the auto mechanics and automotive technology programs to determine the need for improvement in curricula. They found

that the graduates felt the need for more extensive training in the specialty-area and a better communication between industry and automotive training programs. They also expressed a need for licensing the training programs in order to regulate the supply of trained auto mechanics. They considered the wage rate for auto mechanic program graduates lower than other program graduates.

Vocational agriculture programs in Connecticut were studied by Quesada and Seaver (1972). They found that graduates employed on non-farm jobs earned higher income than those working on the farms and that many graduates felt that Future Farmers of America (FFA) had become impersonal and had ignored new fields related to agriculture.

Fentress (1965) studied 320 former home economics students in Ohio. She found that two-thirds of the home economics graduates were employed outside their homes but only about 25 percent in jobs related to home economics. Similar studies have also been conducted surveying health occupations, office occupations, distributive education, technical education, and trade and industry vocational education programs.

Another group of studies deal with special training programs such as MDTA, corrections, TAT (training and technology) etc. Noteworthy among these are Worth and others (1973), London (1967), U. S. Manpower Administration (1968), Dickover and others (1971), and Spencer and Berecochea (1971). All these evaluative studies are based on a follow-up of graduates and former trainees of their respective program areas.

Summary

Most of the research studies classified as Administrative Reports are demonstrative efforts to assess the ratio of vocational trainees placed on jobs to

those who continue their education, or otherwise drop out of the labor market. These studies provide a valuable tool for the local and state administrators to assess their own programs as compared with those in other areas and states. They also provide the basic data to fulfill federal reporting requirements. The accumulation of these data at the state and federal level establishes trends against which periodic performance of different states can be evaluated. However, to the extent that these studies remain individual efforts rather than a standardized nationwide effort, caution will need to be exercised in the use of these data for interstate comparisons. Performance of vocational training programs relevant to labor market participations of trainees within a state is assessed using these follow up data from Administrative Reports.

Comparative Studies

There is another large group of studies which tend to evaluate vocational programs by comparing them with other vocational or non-vocational programs. For example, Eninger (1968) compared trade and industry program graduates with academic graduates and found that there was no significant difference between the starting wages earned by vocational or non-vocational graduates on their first full-time jobs. However, vocational education graduates earned larger and faster increments in their salaries and positions than the academic graduates.

Hawridge and others (1970) tried to compare vocational programs with academic programs for their ability to increase job-placement rate. The results were inconclusive because data available from vocational and academic programs were found to be non-comparable on significant variables.

Paul (1970) compared private vocational school graduates with public school vocational graduates in Oklahoma. He found that private school graduates found jobs related to their training more often than the graduates from public schools. Also, the private school graduates earned, on an average, 31 percent higher income on their first full-time job than the graduates from public schools. On the other hand, about 12 percent of the private-school graduates rated their training as "low" compared with only 5.5 percent by public school graduates.

Haines (1965) compared weekly earnings of men and women graduates, of cooperative programs in offices, distributives, and trade and industry education programs. Some of his findings are listed below:

1. Trade and industry graduates earned higher incomes compared with office education graduates.

2. Male graduates earned higher incomes compared with female graduates of all programs.
3. Earnings of distributive education graduates were found lower than the graduate of both the office, and trade and industry education.

Kaufman and Lewis (1968) in their survey of vocational grades in Pennsylvania found that no significant difference existed in ratings earned (from their respective supervisors) by the vocational graduates and non-vocational academic graduates relative to their work performance. However, the graduates of vocational programs believed themselves to be better prepared for their jobs. A majority of both male and female graduates reported that they were "less than completely satisfied with their pay and opportunities for promotion: in their first jobs.

Many administrative reports and cost-benefit studies could also be termed as comparative studies if data on more than one program were analyzed to draw comparisons. As such, most of the state reports and similar studies could potentially be used to compare the outcomes of one program with another. For example, Paul (1972) compared the graduates and dropouts from vocational programs in Kentucky. Some of his significant findings are listed below:

1. A larger percentage of droupouts was working full time than graduates.
2. There was no significant difference in the wages earned on first jobs.
3. More graduates were working on training related jobs than dropouts.
4. More graduates were satisfied with their jobs than dropouts.
5. Dropouts were more mobile than graduates.
6. Droupouts were characterized by being disadvantages, from rural areas, and of male sex.

The study also showed that dropout rate was lower among the handicapped than among the total student population.

Data banks developed in California, Colorado, Minnesota, Missouri, Oklahoma, and Pennsylvania provide a great variety of descriptive information which has been used to make comparisons between vocational programs and non-vocational academic education. Comparisons have also been made between male and female graduates of vocational programs to determine the impact and efficiency of different vocational programs.

Summary

Although comparative studies lack the rigor of experimental research design, they provide an indication of differential impact of vocational education programs on different student populations. Differences in cultural backgrounds and scholastic achievements of trainees sometimes make meaningful comparisons difficult but the process has proved useful in establishing trends to indicate improvements in some program areas. These comparative trends could be used to generate a limited amount of competition among program administrators in order to foster improvements and better efficiency.

Cost-Benefit Analysis Studies

While there are hundreds of comparative studies, projects, and administrative reports evaluating vocational education, very few have tried to analyze costs and economic benefits of vocational and manpower programs. Stromsdorfer (1972) summarized the problems and some of the reasons why studies in economic analysis were so few in number. Some of his findings are listed below:

1. Cost-benefit analysis should measure the increase in welfare or utility due to an educational program. No direct measures of utility are possible. Indirect measures, such as income, are substantially less than perfect.
2. Adequate measures have not yet been developed to assess consumption benefits of vocational training.
3. Similarly, non-market production and consumption are hard to measure.
4. It is very difficult to sort out the net effect of any given educational investment since all the experiences are cummulative. For instance, it is almost impossible to separate the benefits from in-school vocational education and on-the-job training, because in most cases the latter may not be possible without the former.
5. Area of social costs and social benefits is another one where very little work has been done to measure the economic variables and their effect.
6. Economic acts, and their effects, of third parties external to the vocational education cannot be measured.

The problems of measurement make economic analysis of vocational education extremely hazardous. During the last decade or so a few economists have attempted to find some of the answers to the problems stated by Stromsdorfer. Hu and others (1968) conducted a before-and-after study to compare the cost and benefits of vocational and general curricula graduates. Average monthly earnings of graduates one and six years after graduation were compared. Independent variables in this study were age, sex, race, father's education, and non-economic benefits. Hu found that marginal rate of return on vocational-technical education in Detroit was 31.8 percent and in Philadelphia 8.2 percent. In a similar but separate study Corazinni (1966) found the rate of return in Worcester, Massachusetts, at 17.9 percent on investments in vocational-technical education. In still another study conducted by Kaufman and Lewis (1968), the returns in New York were 4.6 percent for males and zero for females.

Schriver (1971, a) in a statewide study of Tennessee area vocational-technical school graduates found that vocational education increased labor force participation of the graduates. Some of the other findings of this survey which collected follow-up data from 1,701 former students selected from vocational-technical schools are listed below:

1. Students with the lowest educational ability before entering vocational program received the greatest benefits from vocational training.
2. Vocational training, however, was of some benefit to every graduate regardless of educational attainment.

3. Total public rate of return on investment in vocational education 6.3 percent, whereas return on private investment by students was 13.6 percent.

Somers and others (1971) conducted a nationwide study in which cost-benefit comparisons were made of secondary, post-secondary, and college level vocational education programs. Comparative data were also collected from vocational education drop-outs and academic high school graduates. The economic pay-off from junior college vocational programs was found to be the highest even after discounting the cost of additional schooling. The study recommended increased emphasis on general education in vocational training at all levels.

Schriver and Bowlby (1971, b) conducted a study to determine relationship between student characteristics and the benefits derived from vocational education programs. Important findings from this study which surveyed 127 matched pairs of vocational and non-vocational graduates from schools in Memphis, Tennessee, are listed below:

1. There was negative correlation between benefits from vocational training and the I. Q. of students.
2. Health Education program graduates derived the greatest benefit from vocational training.
3. Male graduates derived greater benefits from vocational education than female graduates.
4. Vocation education graduates derived greater benefits from vocational training than non-vocational graduates if the former (vocational graduates) were working on jobs related to their training.

From a study of technical education graduates, Carroll and Ihner (1966) found that post-secondary technical graduates earned only $11 more on their initial job after graduation than the high school vocational graduates. However, after four years on the job, the technical education graduates had increased their margin to $107 per month. Also, the work week of technical graduates was 2.7 hours shorter than the high school graduates. Social return on technical education programs was estimated at 16.5 percent and private rate of return was put at 22 percent. Non-monetary benefits of technical education were not considered for this study.

In order to assess the impact of vocational education on blacks, Teh-wei Hu and others (1969) analysed data on white and non-white high school graduates from 1959-60 graduating classes in Detroit, Philadelphia, and Baltimore. Some of the significant findings from this comprehensive study are the following:

1. The employment rate for whites was significantly higher than non-whites.
2. White graduates earned an average $124 per month more than non-whites during the first year of their employment.
3. After six years there was no significant difference in the monthly earnings of whites and non-whites, however, non-whites worked 8.44 percent more hours on their jobs to earn the same income as non-whites.
4. For black males it was better if they graduated from vocational-technical education programs rather than from comprehensive high school programs. For black females, however, it was better for them to graduate from comprehensive high school programs rather than vocational education programs.

Summary

On the basis of available evidence, it is clear that vocational education is more cost-effective than academic education or comprehensive high school

education. However, the benefits vary considerably between program service areas of vocational education. Cost benefit analysis of different occupational skills is still inconclusive and does not indicate the comparative benefits of different specialties in vocational education.

Procedural Studies

Several states, schools, and agencies have developed follow-up guides and manuals. In addition to data collection instruments there are guides to data compilation and analysis, computer programs and software packages, and reporting formats for the convenience of administrators, researchers and other concerned personnel. Since it is not possible to list all the guides and manuals available in every state, only a few selected ones have been reviewed in this section. Pucel and others (1970) demonstrated in Minnesota how the response rate to a follow-up questionnaire can be increased by offering incentives which vary from a questionnaire printed on colored paper to a cup of coffee (instant coffee in a small bag) enclosed with the questionnaire. Significant increase in response rate using different incentives or combination thereof is claimed by the authors. They have some helpful suggestions for increasing response rates to follow-up questionaires.

Another study conducted by Frazier and Harris (1970) in Oklahoma compared the cost-effectiveness of followup conducted by asking teachers pertinent questions versus sending mail questionnaires directly to the former students. They found that data collected about former students of vocational education programs using teachers as a primary source of data compared very well with data from mail questionnaire directly from the students. The authors, therefore, concluded that since both methods collected data which were biased in certain respects, on cost basis alone, the "teacher follow-up" was a preferred method of data collection.

A study by Gaddis (1970) in Utah outlined the instrumentation and methodology to conduct a five-year follow-up of vocational students. The instruments were designed to collect data on cost-benefit analysis and evaluative comparison of vocational programs. McCracken (1971) developed a set of three guides outlining rationale and data needs of follow-up and job placement activities. The guides were targeted at school board members, school administrators, and vocational teachers.

Pucel (1973) developed a rationale and methodology for conducting follow-up in Minnesota. An important feature of this research study is the effort to measure job satisfaction and employer satisfaction as a part of the follow-up instrumentation. Robertson (1973) developed a descriptive study on the utilization of follow-up for local program planning by school administrators. Needs for planning, goal setting, and evaluation are described in this publication. Paul (1975) developed a system of both short range and long range follow-up instruments and data collection procedures. The system which was pilot tested and validated in Kentucky provides a comprehensive data base for evaluation and longitudinal comparison of vocational education programs. Similar procedural studies have been conducted in California, Washington, Wisconsin, Minnesota, Colorado, Arizona, Oklahoma, New Mexico, South Carolina, Ohio, Michigan, Illinois, Pennsylvania and Tennessee.

Summary

Procedural studies and guidelines are necessary prequisites to a standardized national followup system for vocational graduates. Before a system is adopted as a national model, however, it will be necessary to define in clear terms a national manpower policy outlining specific objectives for vocational education and manpower programs. Currently available systems are all geared to local and state needs and are too diverse in scope and approach to generate easily comparable data at a national level.

FUTURE TRENDS

Budgetary constraints and political realities are exerting inexorable pressure on vocational education administrators throughout the country to make vocational education more responsive to the needs of the economy. Placement of graduates for which they are trained is now required from vocational educators so that every school is functioning as an employment agency. In order to satisfy the demands of accountability, vocational educator must have more and better data, data which are accurate, timely, and locally specific.

Lawrence and Dane (1974) recommend that a nationwide follow-up system should be established using any one of the models already developed, tested, and validated. Federal government support in terms of data from the Internal Revenue Service and Social Security files will be necessary to establish a comprehensive data base of the kind recommended by state administrators. Data on jobs, initial wages, hours worked on jobs, and job satisfaction should be essential elements of this data file.

Another area where very little work has been done lies in the field of economic analysis. It is heartening to see increasing interest among economists and social scientists in developing and testing new and innovative methods to measure cost and benefits of vocational education. Demand for complete accountability of vocational programs, already gaining momentum, will keep the need for cost-benefit type studies at a high enough level to attract, it is hoped, researchers to this challenging area of inquiry.

Vocational educators seem to have been preoccupied with the students and their needs (including their need for a job). The employer and his needs were considered secondary and external to the educational process. Development of career education programs, the recessionary economy, and depressed labor market have brought about a marked change in this attitude. There seems to be an insatiable demand for locally oriented occupational demand data and information about job contents. Occupational and task analysis studies have significantly increased during the past few years. Contacts between the vocational educators and employers have also been improving steadily.

In a recently conducted survey (Center for Vocational Education, 1975), where vocational education administrators, teachers, and supervisors were asked to list and rank-order the criteria which should be used to evaluate vocational training programs, the responses were very revealing. The top five criteria to measure the effectiveness of vocational education out of a total of 66 reflected the awareness of employer needs by the vocational educators. The table on the following page lists the ten criteria ranked highest in this survey. This trend of increased awareness of employer needs is also reflected in the number of research studies to measure employer satisfaction with the vocational graduates. One of the most important studies in this area was conducted by Pucel (1973) who developed a questionnaire to collect data and measure employer satisfaction as a part of follow-up surveys.

Little has been done thus far in the area of measuring the match between skills learned in vocational programs with the actual occupational practices. Braden and others (1970) pioneered an effort to match demand with supply of manpower that is subject to vocational training. Further work needs to be done

TABLE

RANKINGS OF THE TOP TEN SELECTED CRITERIA

Evaluative Criterion	Rank*
Program content is current with occupational practice	1
Employer satisfaction with graduate's skills	2
Program based on an analysis of requirements of occupation	3
Safety practice as an integrated part of the program	4.5
Basic work, job ethic skills and attitude development taught	4.5
Attitudes and support of school administrators toward vocational education	6
Job placement services available to all program trainees	7
Courses developed with the advice and cooperation of representatives of the occupation	8
Labor market demand for training provided	9.5
Supplies and equipment	9.5

*All rankings based on number and rank each item received from the total sample.

Source: "Program Evaluation Inventory" The Center for Vocational Education, Ohio State University, Columbus, Ohio, 1975.

to apply the concept of matching to skills rather than the job titles as was done in the Braden study. Occupational analysis of jobs and behaviorally stated training objectives seem to be the direction for research studies to measure the match between training skills and job requirements.

CONCLUSIONS

One of the key elements of regional economic development is the availability of human resources with the right skills, in right numbers, and at the right time. A pool of trained manpower is a prerequisite for attracting new investments in industry and business to promote economic development. At the same time, new and developing industries create additional demand for trained manpower and thus encourage new and improved training programs.

In any plans for developing our human resources, vocational education programs play a dominant role because they impact a large number of youths and adults. In 1974 there were 13.5 millions persons enrolled in public school vocational education programs in the United States. In addition about two million persons are trained annually by private schools. The impact of these programs on the labor market, however, is a function of both prevailing economic conditions and their own efficiency. The latter can be improved by systematic planning and judicious allocation of resources. Both of these factors are facilitated greatly by a continuous supply of labor market and economic analysis data.

Economic analysis of vocational education programs involves the cost data and the impact measures on the labor market as well as on the participants of training programs. Followup data are generally collected to measure the economic impact of vocational education on the labor market and the individual trainees.

A survey of available literature reveals that follow-up studies continue to suffer from some severe problems, some of which are procedural and others

are conceptual. Data collection is primarily geared to questionnaire surveys and interviews, both suffering from the problem on non-response and inadequate sampling. Non-coordination between the schools and the data collection agencies on the one hand and between schools and the vocational education graduates on the other adds significantly to the problem of potentially biased data due to non-response and sampling inadequacies.

Conceptual difficulties arise from a lack of adequate measures to assess the economic and non-economic benefits of vocational education. Another problem relates to separating the impact of non-school activities from educational or vocational activities in order to assess the benefits from training. Relationship between vocational education and economic cycles has also not been studied adequately. There is an urgent need for increased research activities in these areas of economic inquiry.

It is generally agreed that important decisions related to vocational education and affecting billions of dollars and millions of people are being made without adequate information about the impact or effectiveness of vocational education. A very urgent need exists to encourage and sponsor research efforts on a higher scale at the state, regional, and national level. This will be the first step in developing a system for allocation of resources for vocational programs and activities to develop right skills needed to implement regional economic plans.

BIBLIOGRAPHY

Bates, Wilfred M. An Examination of the Relationship of Selected Variables to Interstate-Geographic Mobility of Technician Graduates of the Associated Degree Programs in Oklahoma. Stillwater, Oklahoma: Research Coordinating Unit, State Department of Vocational Education, 1968.

Braden, Paul V.; Harris, James L.; Paul, Krishan K. Occupational Training Information System (OTIS): Final Report Complete with System Documentation. Stillwater, Oklahoma: Research Foundation, Oklahoma State University, 1970.

Carroll, Adger B., and Ihnen, Loren A. Cost and Returns of Technical Education: A Pilot Study. Raleigh, North Carolina: Department of Economics, North Carolina State University, 1966.

Center for Vocational Education. "Program Evaluation Inventory". Columbus, Ohio, 1975.

Corazzini, A. J. Vocational Education: A Study of Benefits and Costs. Princeton, New Jersey: Industrial Relations Section, Princeton University, 1966.

Dickover, Robert M., et al. A Study of Vocational Training in the California Department of Corrections. Sacramento, California: California State Department of Corrections, Research Division, 1971.

Eninger, Max U. The Process and Products of Trade and Industry High School Level Vocational Education in the United States. Pittsburgh, Pennsylvania: Educational Systems Research Institute, 1968.

Fentress, Janet. Post High School Activities of Girls with Four Years of Home Economics and Their Attitudes Toward Home Economics Related Occupations. Columbus, Ohio: The Ohio State University, 1965.

Frazier, William D., and Harris, James L. A Comparison of Two Follow-up Methods to Survey Occupational Training Graduates. Stillwater, Oklahoma: Research Coordinating Unit, State Department of Vocational Education, 1970.

Gaddis, G. Watten. Project "Follow-Up": Interim Report, Salt Lake City, Utah: Research Coordinating Unit for Vocational and Technical Education, 1970.

Green, Ralph. Vocational Educational Follow-Up Study: Parents Attitude Toward Nebraska Vocational Technical Schools' Educational Program and Students' Occupational Aspirations: Final Research Report. Lincoln, Nebraska: Nebraska Occupational Needs Research Coordinating Unit, 1971.

Haines, Peter G. How High School Cooperative Trainees Fare in the Labor Market: Phase B. East Lansing, Michigan: Bureau of Educational Research Services, College of Education, Michigan State University, 1965.

Hawkridge, David G., et al. A Study of Selected Programs for Vocational Education in Secondary Schools: Final Report. Palo Alto, California: American Institute for Research in Behavioral Sciences, 1970.

Hu, Teh-Wei, et al. A Cost Effectiveness Study of Vocational Education: Final Report. University Park, Pennsylvania: Institute for Research on Human Resources, Pennsylvania State University, 1968.

Hu, Teh-Wei, et al. A Cost Effectiveness Study of Vocational Education: A Comparison of Vocational and non-Vocational Education in Secondary Schools, Final Report. Institute for Research on Human Resources, Pennsylvania State University, 1969.

Kaufman, Jacob J., and Lewis, Morgan V. The Potential of Vocational Education: Observations and Conclusions Based on a Study of Three Selected Cities in Pennsylvania. University Park, Pennsylvania: Institute for Research on Human Resources, Pennsylvania State University, 1968.

Lawrence, John E. S., and Dave, J. K., Editors. State Vocational Education Planning: An Assessment of Issues and Problems. Raleigh, North Carolina: School of Education, North Carolina State University, 1974.

London, H. H. How Fare MDTA Ex- Trainees? An Eighteen Months Follow-Up Study of Five Hundred Such Persons. Columbia, Missouri: University of Missouri, 1967.

McCracken, J. David, et al. Targeted Communications for Instituting Vocational Placement and Follow-Up: Interim Report. Columbus, Ohio: Center for Vocational and Technical Education, Ohio State University, 1971.

New Mexico State Department of Education, New Mexico Area Vocational School Follow-Up Studies. Santa Fe, New Mexico: Research Coordinating Unit, Vocation Education Division, 1968.

Paul, Krishan K. An Assessment of the Oklahoma Private School Occupational Training Programs with Implications for Statewide Planning. Stillwater, Oklahoma: Oklahoma State University, 1970.

Paul, Krishan K., et al. Final Report on Establishment of a Comprehensive Data System for Occupational Training in Kentucky. Columbus, Ohio: Center for Vocational and Technical Education, Ohio State University, 1972.

Paul, Krishan K. "Dropouts: Statistics and Persons". Paper presented at the American Vocational Association Convention at Chicago, 1972.

Petrich, Beatrice, et al. Assessment of Felt Needs for Preparation in "Life Skills" of Graduates of Diploma and Associate Degree Programs in the Wisconsin Vocational, Technical, and Adult Education System. Madison, Wisconsin: University of Wisconsin, Department of Home Economics Education, 1972.

Pucel, David J. The Minnesota Vocational Follow-Up System: Rationale and Methods. Minneapolis, Minnesota: University of Minnesota, 1973.

Pucel, David J., et al. Questionnaire Follow-Up Returns as a Function of Incentives and Responder Characteristics. Minneapolis, Minnesota: Department of Industrial Education, University of Minnesota, 1970.

Quesada, R. M., and Seaver, S. K., Education, Employment and Income of High School Vocational Agriculture Graduates: Final Report. Starrs, Connecticut: Agrigultural Experiment Station, University of Connecticut, 1972.

Robertson, J. Marvin. Utilizing Manpower and Follow-Up Data: A Perspective for Local Vocational Planning. Columbus, Ohio: Center for Vocational and Technical Education, Ohio State University, 1973.

Schriver, William R., and Bowlby, Roger. The Effects of Vocational Training on Labor Force Experience: An Analysis of the Tennessee Area Vocational Technical School System. Memphis, Tennessee: Center for Manpower Studies, Memphis State University, 1971, a.

An Analysis of Differential Benefits from Vocational Training: Final Report: Memphis, Tennessee: Center for Manpower Studies, Memphis State University, 1971, b.

Seamans, Melvin, et al. An Evaluative Study of Auto Mechanics and Automotive Technology Programs and Curricula: Final Report. Madison, Wisconsin: Madison Area Technical College, 1972.

Somers, Gerald G., et al. The Effectiveness of Vocational and Technical Programs: A National Follow-Up Survey. Madison, Wisconsin: Center for Studies in Vocational and Technical Education, University of Wisconsin, 1971.

Spencer, Carol, and Berecochea, John E. Vocational Training at the California Institution for Women: An Evaluation. Sacramento, California: California State Department of Corrections, Research Division, 1971.

Stromdorfer, Ernst W. Review and Synthesis of Cost-Effectiveness Studies of Vocational and Technical Education. Columbus, Ohio: Center for Vocational and Technical Education, Ohio State University, 1972.

Taves, Marvin J., and Coller, Richard W., In Search of Opportunity: A Study of Post High School Migration in Minnesota. Minneapolis, Minnesota: Agricultural Exploration Station, University of Minnesota, 1964.

U.S. Department of Labor, Manpower Administration. The Influence of MDTA Training on Earnings: Manpower Evaluation Report No. 8. Washington, D. C.: Government Printing Press, 1968.

Worth, Charles C., et al. Survey of Post-Placement Experience of TAT Graduates. Oak Ridge, Tennessee: Oak Ridge Associated Universities, 1973.